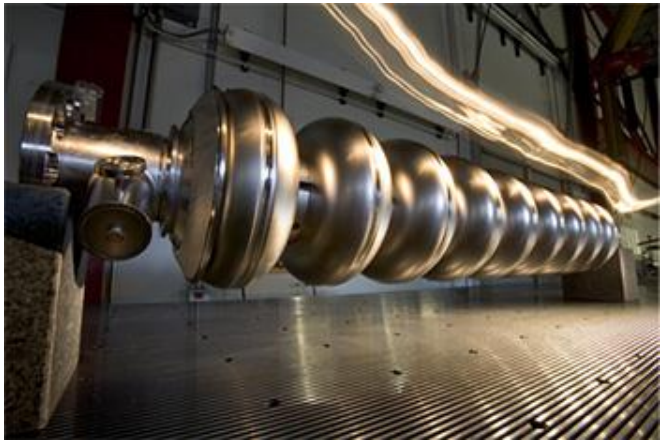
Testing and Analysis of 'Bare' Superconducting RF Cavities

Cole Cook
Mentor: Elvin Harms

Fermilab

SRF Background

- Why SRF over Conventional RF cavities
- Made of High Purity Niobium
  - T_{crit}=9.25K
- Lower Surface Resistance
- Higher Quality Factor, $Q = \frac{\omega U}{P}$
  - Promote Larger Accelerating Gradients, $E_{acc} = Z\sqrt{QP}$
- Technology of Choice
  - LHC, Project X, ILC



Picture found at http://projectx.fnal.gov/superconducting-rf.shtml

Research Outline

- Perform Vertical Single Cavity Tests at A0
  - 1.3 and 3.9 GHz Single Cell, 3.9 GHz 9 Cell
  - Bare Versus Dressed
- Data and Performance Analysis
  - R&D – BCP vs. EP
  - Thermal Analysis if Time Permits
- Create one Unified LabVIEW vi for Cavity Tests

Picture found at
http://www.interactions.org/cms/?pid=2100&image_no=FN0329

Preliminary Graphs